

**MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS - STANDARD SPECIFICATION
D-752**

Concrete Culverts, Headwalls, and Miscellaneous Drainage Structures

DESCRIPTION

1.1 This item shall consist of either plain or reinforced concrete culverts, headwalls, and miscellaneous drainage structures constructed in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the Engineer.

MATERIALS

2.1 **Concrete.** Plain and reinforced concrete shall meet the requirements of Item P-610. The course aggregated size shall meet the 1 ½ inch maximum gradation.

CONSTRUCTION METHODS

3.1 **Unclassified Excavation.**

(a) Trenches and foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the plans or as staked by the Engineer. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximate only; and the Engineer may order, in writing, changes in dimensions or elevations of footings necessary to secure a satisfactory foundation.

(b) Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface, either level, steeped, or serrated, as directed by the Engineer. All seams or crevices shall be cleaned

out and grouted. All loose and disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation, and excavation to final grade shall not be made until just before the concrete or reinforcing steel is to be placed.

(c) The Contractor shall do all bracing, sheathing, or shoring necessary to perform and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for structural concrete.

(d) Unless otherwise provided, bracing, sheathing, or shoring involved therewith shall be removed by the Contractor after the completion of the structure. Removal shall be affected in a manner which will not disturb or mar finished concrete. The cost of removal shall be included in the unit price bid for structural concrete.

(e) After each excavation is completed, the Contractor shall notify the Engineer to that effect, and concrete or reinforcing steel shall be placed after the Engineer has approved the depth of the excavation and the character of the foundation material.

3.2 **Backfilling**

(a) After a structure has been completed, backfilling with approved material shall be accomplished by applying the fill in horizontal layers not to exceed 8 inches in loose depth, and compacted to the density required in Item P-152, and as determined by FAA compaction control tests T-611.

(b) No backfilling shall be placed against

any structure until permission is given by the Engineer. In the case of concrete, such permission shall not be given until concrete has been in place 7 days, or until tests made by the laboratory under supervision of the Engineer establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

(c) Fill placed around concrete culverts shall be deposited on both sides at the same time and to approximately the same elevation. Care shall be taken to prevent any wedging action against the structure, and all slopes bounding or within the areas to be backfilled shall be stepped or serrated to prevent wedge action.

(d) Backfill will not be measured for direct payment. Performance of this work under the contract is not payable directly but shall be considered as a subsidiary obligation of the Contractor, covered under the contract unit price for "Unclassified Excavation for Structures."

3.3 Weep Holes. Weep holes shall be constructed as shown on the plans.

3.4 Cleaning and Restoration of Site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankment, shoulders, or as ordered by the Engineer. The Contractor shall restore all disturbed areas to their original condition.

After all work is completed, the Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

METHOD OF MEASUREMENT

4.1 The amount of concrete to be paid for shall be the number of cubic yards of concrete, complete in place and accepted. In computing the amount of concrete for payment, the dimensions used shall be those shown on the

plans or ordered by the Engineer. No measurements or other allowances shall be made for forms, false work, cofferdams, pumping, bracing, expansion joints, or finishing of the concrete. No deductions in yardage shall be made for the volumes of reinforcing steel or embedded items.

4.2 The amount of reinforcing steel to be paid for shall be the calculated theoretical number of pounds placed as shown on the plans, complete in place and accepted. The unit weight used for deformed bars shall be the weight of plain square or round bars, as the case may be, of equal nominal size.

BASIS OF PAYMENT

5.1 Payment will be made at the contract unit price per cubic yard for concrete for the structures; and at the contract unit price per pound for reinforcing steel. These prices shall be full compensation for furnishing all materials and for all preparation, excavation, and placing the materials, and for all labor, equipment, tools, and incidentals necessary to complete the structure.

Payment will be made under the nomenclature and seven digit item number specified in the plans and proposal for structural concrete and reinforcing steel drainage structure work required per cubic yard or per pound, as applicable.

The first three digits of any item number for work included under this specification shall be 752, i.e. 752XXXX.

TESTING AND MATERIAL REQUIREMENTS

Test and Short Title

FAA T-611 - Density

Material and Short Title

None

Note: Others as required by referenced specifications. Cross-referenced specifications required P-152, P-610.